

It is possible that additional specimens of *parapini* are present in some collections under the name *pini* Montandon: Specimens identified as *pini* are especially suspect if they were collected in New Mexico or Texas.

HOST FEEDING OF *CULISETA MORSITANS*

ROBERT C. WALLIS, *Connecticut Agricultural Experiment Station, New Haven*

The ecology and bionomics of mosquitoes feeding on avian hosts have recently become important, as epidemiological studies involve wild birds and domestic pheasants as hosts of eastern equine encephalitis. However, knowledge of many mosquito species, particularly of the host-feeding preference, is not available. This article reports observations on the biology of one of these little known species, *Culiseta morsitans*.

The biology of the larvae of this species was published by Horsfall in 1955, but little has been reported on the feeding habits of the adult.

Carpenter and LaCasse (1955) say the females of the species rarely, if ever, feed on man. They indicate that *C. morsitans* probably feeds on birds and cite an account of a female feeding upon the blood of a breenfinch (Natvig 1948). However, there is little evidence concerning the source of the blood meal of this species. There is no indication that this mosquito even requires blood, since engorged specimens have not been reported. Wesenberg-Lund (1921) examined thousands of wild females and found none with blood in the alimentary tract.

Experimental.—Biweekly collections of *morsitans* adults were obtained from diurnal resting places in the vicinity of a domestic pheasant pen at Shade Swamp, Connecticut, throughout the early summer of 1956. During two 4-week periods, prior to and after 6-week-old pheasants were placed in the pen, the number of female *C. morsitans* containing fresh blood were counted and recorded. Blood smears from specimens containing fresh blood meals were prepared for microscopic examination.

Results.—Within a 4-week period, from June 16 to July 14, 1956, pheasants were placed in the pen, the number of female *C. morsitans* contained fresh blood meals out of a total of 115 females of this species collected. However, the collection taken during the first week after the pheasants were in the pen, July 14 to July 21, contained 18 blooded specimens out of 27. The incidence of blooded specimens in collections during the next 2 weeks remained high and then dropped in the fourth week. In the second week, July 21 to July 28, 6 were blooded out of 14 collected. In the third week, July 28 to August 4, 6 were blooded out of 23 specimens. During the fourth week, August 4 to August 11, 1 out of 14 had engorged with blood. In this 4-week period after the young pheasants were placed in the pen, a total of 31 blooded specimens out of 88 *C. morsitans* were collected. The percentage incidence of blooded specimens for this 4-week period was 35.2 percent as compared with 2.6 percent for the previous 4-week

period. Blood smears prepared for microscopic examination revealed that 6 out of 6 blood-engorged specimens contained nucleated red blood cells.

Discussion—During the past 3 years this laboratory has been concerned with the ecology of mosquitoes feeding on pheasants, because of the repeated occurrence in Connecticut of eastern equine encephalomyelitis in domestic pheasants. Particular observations have been made of *Culiseta* (Wallis 1953) since Chamberlain *et al.* (1951) reported isolation of the virus from *C. melanura* and Holden *et al.* (1954) reported isolation of three strains of virus from pools of the same species collected near a pheasant pen in New Jersey.

During the early summer months, adult *C. morsitans* were routinely collected in diurnal resting places in past years, but it was not until 1956 that careful observation of blood-engorged specimens could be correlated with the stocking of the pheasant pen. The sharp increase in the number of specimens containing blood was startling, and could not be connected with any other change in the environment. Wild bird and other potential host populations within the area were apparently constant during the two periods. It may be postulated that since a smaller total number of adults was in the cage collections in the latter 4-week period, the percentage of fed specimens would naturally increase. Also, the females in the population may not have been ready to feed earlier in the season. However, the proportion of blood-engorged specimens during the first week the pheasants were available was considerably higher than for subsequent weeks. From this, it appears that a backlog of females ready to feed was built up in the population and the young pheasants provided a suitable host population.

REFERENCES

- Carpenter, S. J., and LaCasse, W. J. 1955. Mosquitoes of North America, Berkeley, Calif. Univ. Calif. Press. 6, 386 pp.
- Chamberlain, R. W., Rubin, H., Kissling, R. E., and Edison, M. E. 1951. Recovery of virus of Eastern equine encephalitis from a mosquito, *Culiseta melanura* (Coquillett). Proc. Soc. Expt. Biol. and Med. 77: 396-397.
- Holden, P., Miller, J. B., and Tobbin, D. M. 1954. Isolations of eastern equine encephalomyelitis virus from mosquitoes (*Culiseta melanura*) collected in New Jersey 1953. Proc. Soc. Expt. Biol. and Med. 87: 457-459.
- Horsfall, W. R. 1955. Mosquitoes. Their Bionomics and Relations to Disease. Ronald Press Co., New York. 723 pp.
- Natvig, L. R. 1948. Contributions to the knowledge of the Danish and Fennoscandian Mosquitoes: Culicini. Norsk. Ent. Tidsskr., Sup. 1, 567 pp.
- Wallis, R. C. 1953. Notes on the Biology of *Culiseta melanura* (Coquillett). Mosquito News. 14: 33-34.
- Wesenberg-Lund, C. 1920-1921. Contributions to the biology of the Danish Culicidae. Host and Son, Copenhagen. 210 pp.